State of California
AIR RESOURCES BOARD

Research Screening Committee Meeting
Cal/EPA Headquarters Building
1001 I Street
Conference Room 550
Sacramento, California 95814
(916) 445-0753

May 25, 2006
8:00 a.m.

ADVANCE AGENDA

Draft Final Report

1. "Asbestos to Particulate Matter Derived from Brake Wear," Department of Health Services, $131,055, Contract No. 01-333

Disc brake pads and drum brake linings are currently exempt from the U.S. EPA ban on the production of asbestos-containing products. Hence there is still some asbestos used in motor vehicle brakes. The objectives of this study were to determine the extent of existing and expected future asbestos use in brakes, to characterize the asbestos composition and to quantity of asbestos emissions from brake wear, and to assess the need for regulations to controls these emissions. The first task of the project determined the vehicle makes and models most likely to still use asbestos brake friction material. Using this list, the contractor collected from brake repair shops used brakes and brake wear dust from vehicles most likely using asbestos-containing brakes. Analytical procedures and methods were developed for analyzing the friction material and brake dust samples. The contractor then characterized the asbestos in the bulk friction material and particulate matter (PM) brake dust, with respect to fiber composition, fiber mass, and fiber size distribution. To understand how much of the asbestos contained in brakes actually becomes air borne, chassis dynamometer tests were conducted on a vehicle with asbestos-containing brakes. Airborne brake wear emissions over two different driving cycles were measured. The asbestos content of brake wear emissions, brake dust, and brake friction material was determined. A comparison of asbestos fiber size distribution for the air borne emissions to the corresponding size distribution for the brake dust over the two driving cycles was made.

The asbestos contents of the brake dust and the air borne brake wear PM emitted during vehicle braking are much less than the asbestos content of the brake friction material. The chrysotile asbestos content of the brake dust ranged from 0.001 to 0.02 percent, and the asbestos content of the air borne brake wear emissions ranged from 0.01 to 0.02 percent, while the asbestos content of the brake wear friction material ranged from 25 to 60 percent. Increasingly, newer vehicles are using front- and rear-

wheel disc brakes made of non-asbestos friction material, resulting in a decrease in the fraction of vehicles still containing asbestos in brakes. However, a follow-up study specifically designed to quantify the actual fraction of vehicles in the fleet using asbestos brakes might be needed to better determine the need for regulations.